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## REVIEWS OF RECENT LITERATURE.

### ANTHROPOLOGY.

**Human Spines.**<sup>1</sup>—The paper is, in the words of the author, “a description of forty-five anomalous human spines in the Warren Museum,” and of a number of special parts of the spinal column from the same collection ; it is also a discussion of the causes of the spinal variations.

The author describes five classes of spinal anomalies, namely :

1. Spines in which the number of præsacral is normal, but in which there is an irregularity at the junction of the thorax and loins, or at the junction of the thorax and neck.

2. Spines in which the 26th is the *v. fulcralis*, but in which the 25th is not quite separated from it.

3. Spines in which there are more than 24 perfectly free præsacral, the extra one being thoracic, or lumbar, or there being two extra præsacral, one thoracic and one lumbar, the latter sacralized on one side, the 27th being the *fulcralis*.

4. Spines in which one or more præsacral vertebræ are imperfectly developed, one or more vertebræ being fused, the atlas being fused with the occiput, or the 24th being more or less sacralized.

5. Spines in which there is a præsacral too few : a vertebra being wanting in the loins, in the back, there being 12 pairs of ribs, the first pair being cervical and perfect on one side, the 24th being in all the groups the *fulcralis*.

There are further described cervical, rudimentary first thoracic, bicipital and tricipital ribs ; fusion of atlas and occiput, of atlas and axis, axis and third cervical vertebra ; a suppression of a cervical and an extra half vertebra.

The main facts brought out by the paper are (1) a lack of relation between the condition of the spine at one end of the thorax and that at the other, and (2) the frequency of “concomitant” variations on one or both sides of the spine.

<sup>1</sup> *Dwight, Thomas*. Description of the Human Spine, showing Numerical Variation, in the Warren Museum of the Harvard Medical School. *Memoirs of the Boston Society of Natural History*, vol. v, No. 7 (Boston, 1901), pp. 237-312, with figures.

(1) "If the undeveloped end of the 1st thoracic rib is a step towards the future, it would be reasonable to expect in the same spine a corresponding advance below the thorax. Conversely, if there is an archaic condition below the thorax, there should be an analogous condition above it. While there are cases that fulfill these conditions, they are quite lost in the multitude which do not, and which even present contradictory conditions at the opposite ends of the spine, being retrogressive at one end and progressive at the other."

These facts are in contradiction to Rosenberg's theory.

(2) The author points to the cases where "we see a tendency sometimes for the whole thorax to move forward (upward?) by cervical ribs associated with absence of the last thoracic ones or with their existence in a rudimentary condition." "We also see cases in which, when the cervical rib on one side is distinctly larger than its fellow, the last rib on that side is either correspondingly smaller than its fellow, or even replaced by a pretty typical transverse process." These *concomitant variations* "may extend even further, so as to include the sacralization of one side of the last lumbar, or even the absorption of one side of the atlas into the occiput."

The causes of the variation: The author confesses his inability to show the original cause of the phenomenon. "It is clear, however, that the vertebræ at the junction of regions are particularly variable, and it seems hard to doubt that errors of segmentation may occur. The original error having occurred, there seems to be a tendency in the organism to reproduce the type as nearly as may be under the changed conditions; to make as normal a series of regions as circumstances will permit; and this tendency manifests itself to some extent independently in the two halves of the spine." For this tendency the author adopted the old and rather unsatisfactory theory of "the vital principle."

Professor Dwight closes his interesting work with the following additional deductions:

1. Variations occur in two ways: (1) by irregular development of the costal elements at and near the ends of the regions of the spine, and (2) by irregular segmentation through which there are more or fewer vertebræ than normal.

2. Variations of both kinds are variations around a mean. It is not impossible that some of them may be reversive; that any are progressive is mere assertion.

3. Assuming the correctness of Rosenberg's studies in ontogenesis,

his view may account for some of the variations, but even in these cases something more is needed to explain the concomitant changes.

4. Variation of the costal elements at one end of a region is often associated with variation of an opposite nature of those at the other end. Several regions may be involved, and the two sides may vary independently.

5. Variations, which separately seem either reversive or progressive, generally lose that appearance when the whole spine is considered.

6. After the occurrence of the original error in development there is a tendency for the spine to assume as nearly as possible its normal disposition and proportions. This, as do also concomitant variations and indeed all development, implies a "vital principle."

These deductions of the author naturally invite discussion; but it will be of advantage if this be deferred until the material bearing on the points in question is still more abundant and the observations extended. Conclusions of this nature apply not only to the part under consideration but largely to the whole skeleton.

A. H.

**Notes.**—Four "Cruciform Structures near Mitla" are described by Mr. M. H. Saville in Vol. XIII of the *Bulletin of the American Museum of Natural History*. After a scholarly summary of the history of previous explorations at Mitla the author confines his attention to the cruciform burial chambers which are unique in form and surpass all other tombs in Mexico or Central America in size and in beauty of stone work.

"A Bilateral Division of the Parietal Bone in a Chimpanzee; with a special Reference to the Oblique Sutures in the Parietal," is the subject of a paper by Dr. Aleš Hrdlička, appearing in the same volume. It contains a detailed description of the skull of an adult male chimpanzee, with a discussion of the important problems connected with the abnormal parietal sutures. An oblique suture, the author believes, can be attributed to only three possible causes, as follows: an early fracture, a persistence of the original separation between the two centers from which the bone is developed, and a coexistent difference between their relative positions; the existence of a supernumerary third center of ossification. The brochure is illustrated by six outline drawings.

In the *Report of the Museums Association of the United Kingdom* for 1898 Mr. Harlan I. Smith advises an "ethnological arrangement